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Metritis from a Practitioner's Standpoint.*

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The subject of metritis merits our attention not alone in regard to the preservation of individual life. It also holds a particularly significant position both in relation to sterility and in the work of public hygiene. The day may not be far distant when the public will awaken and demand a pure milk supply, when it may become compulsory to isolate and scientifically treat all animals showing any abnormal condition of the uterus. It is, therefore, imperative that both the pathology and therapy of that organ should be carefully considered. The forms of metritis we meet in practice may, perhaps, for the purpose of this paper, be divided broadly under two heads.

1. Septic metritis, with its acute, rapid, usually fatal course, where the invading organism breaks down the defensive forces of the part and gains access to the blood stream.

2. To include the less fatal forms of the disease, varying greatly in degree from a simple envolvement of the uterine mucosa (endometritis) to a suppurative form envolving the mucous, muscular and serous coats.

It is particularly on this second group that I want to centre my remarks in this all too comprehensive subject, and I may here say that I wish these few notes to take the form of an enquiry rather than a *dictum*, as I realise my personal experience is far too limited and my conclusions all too hazy.

My second classification includes those phases of the disease which respond more readily to treatment, but which I am of opinion far too often take an unfavourable course, and, indeed, my own observations have led me to wonder whether metritis may not be responsible for more deaths than we are sometimes inclined to hold.

I have in mind particularly one form, and that is where the *os uteri* is closed, or practically closed, and where, therefore, the absence of any discharge leads us astray in our diagnosis. For instance, a Jersey cow, which had a difficult calving, a few days afterwards refused to feed. The temperature was high and pulse rapid, the *os* had closed, and vaginal exploration on several occasions revealed only a clear mucus. Temperature later became quite normal, the udder became indurated and there was some looseness of the bowels. Tonics and stimulants were useless. Fifteen days later a *post-mortem* revealed a necrotic gangrenous state of the uterus with generalised pyæmia.

A Shorthorn cow a day or two after calving suddenly went off her feed; her temperature was 104°. The case at first resembled those acute but fleeting fevers to which cows appear predisposed. The cow had cleansed normally; uterine exploration was impossible. Vaginal exploration on several occasions only revealed a clear mucus; the cow, with remissions and exacerbations, gradually became worse and exhibited symptoms of great pain, although the temperature dropped. *Post-mortem* revealed a metritis, the uterus containing a pint or so of chocolate-coloured exudate.

The vagina of an otherwise healthy cow was being irrigated; a small quantity of the disinfectant fluid was allowed to enter the uterus through the narrow *os* which would hardly admit the syringe nozzle. The cow immediately showed discomfort, swishing of the tail and paddling, later the animal went off her feed, the temperature was variable, and chronic wasting took place. The practitioner in attendance did not suspect metritis, not knowing at the time the full history of the case. Autopsy revealed an infected uterus.

In connection with the closure of the uterine cervix there is an interesting article by Harvey (1).

It is quite common for a practitioner to be consulted regarding one cow in a herd off her feed, probably scouring and not doing well. Johne's disease may be suspected, and an astringent tonic prescribed. The case may be far from the surgery and not seen again: the end may be the knacker's yard. Is it not possible that some of these cases involve a metritis, that a thorough douching of the uterus at the time might have turned the course of the case? At any rate, is it not within the range of possibility that at least some of the cases I have cited might have been saved had diagnosis and treatment been early?

Etiology. In a paper of this kind the etiology of metritis must be discussed very briefly, but from the conclusion of many investigators, it seems that *B. pyogenes* and *streptoccoccus* play the most important pathologic rôles. *B. abortus* is usually an exciting organism—while it itself does not cause a grave danger, it conduces to a lowered resistance of the uterine structures and, during such time, other pathologic organisms may enter and cause a more

* Presented to the South Eastern Veterinary Association at Canterbury on September 27th.

severe reaction. However, should no further infection enter following an abortion, the metritis caused speedily clears up. This view is corroborated by Edwards (2) writing regarding the association that exists between contagious abortion, sterility and metritis. He says, "the abortion bacillus in itself is not accountable to a noteworthy degree for either condition, but the secondary invaders which might equally well gain entry subsequent to *any other* such antecedent condition and are not necessarily of a specific character must be held responsible for these sequelæ when they do occur."

Beaver (3) says, "Acute catarrhal metritis is very frequently seen and is usually associated with abortion, while acute suppurative metritis, in the vast majority of cases, results from puerperal infection at either abnormal or full time parturition.

"Retention of the placenta in either case is a vital contributing factor of the utmost importance."

Regarding the therapy of the uterus, there has always seemed a diversity of opinion. Perhaps this, in part, is not surprising, for the resistance which a bovine animal has to putrefactive actions within the uterus, even a decomposing placenta, and the comparative rarity with which fatal results follow when nature is left unmolested, are well known. On the other hand, the disconcerting consequences of a blundering technique and indiscreet use of strong antiseptics have left their permanent prejudices, and there are those who are opposed to interfering with the uterus under any circumstances whatever. I consider, however, that neglect of treatment of the simpler forms of metritis has a farther-reaching significance than the life of the animal. In this connection I do not know of any work that has been done to ascertain the economic loss in milk and flesh through uterine infection of uncleansed and neglected cows, but Grimm (4), in some interesting records, has shown a direct ratio between retained after-births and sterility. He points out the diminution of chronic catarrhal metritis following scientific supervision of a previously neglected large dairy herd.

This view is endorsed by Groome and J. McCoy (5).

Prophylaxis. Considering the matter generally as it is related to public health, prophylaxis should be aimed at rather than treatment, in the first place in an effort to rear healthy calves and to breed only from clean animals. Maternity barns should be established on all farms where milk is supplied for human food. Here each animal should be inspected at a time when examination and treatment are easy, and no animal allowed to enter the herd until all discharge ceases. In this manner the opportunity of spreading the infection would be greatly reduced. Further, whatever is done is to be done with the utmost cleanliness. Grimm (4) says, "It has been repeatedly shown that where grave constitutional disturbances, with metritis and peritonitis, develop, the infecting organism is quite frequently conveyed directly to the uterus from without."

Treatment. Regarding the actual treatment of the uterus, is it not rational that it should follow the lines of other wound treatment? Infection being, when necessary, and as far as possible, mechanically removed by non-irritating fluids such as normal saline or aqueous solution of iodine (1 per cent.), and the organ rid of every possible obstacle, thus assisting the defensive forces of the body in the actual reparative process. Owing to the enclosed situation of the uterus, some insoluble, non-irritating antiseptic is usually advisable, to inhibit bacterial activity.

Pessaries containing salol (2%), iodoform (1%), recommended by Reeks (6) have given good results with me. He inserts two, three, and sometimes four pessaries at a time. W. L. Williams (7) recommends iodoform and bismuth subnitrate—an efficient formula of which he considers is pulv. iodoform and boracic acid, ℥ss. of each, with gr. iii-v. thymol, in a gelatine capsule, or iodoform or bismuth suspended in a neutral oil—as liquid paraffin, and inserted by means of a hospital irrigator.

Animal charcoal has given good results. Ressinger, Heller and Versinger (8) claim that it acts not only physi-chemically on morbid substances and absorbs bacteria, but forms an irreversible mixture, which has a prohibitory effect on inflammatory and putrefactive processes. Following successes in human metritis, 14 cows were experimented with. The uterus was cleansed with warm sterilised water, then washed with the fluid paste made from animal charcoal—1 part to 25 parts of water. The average dose of charcoal was 50 grammes to a litre of water, but as many as 100-300 grammes to the litre were used. All the 14 cases in the experiment said to be septic metritis recovered in 8 to 17 days.

All this sounds very simple, and no doubt is, with recently-calved cows, but the majority of cases of metritis which have given me trouble were cases occurring at least a week or so after calving, when the *os* would not admit the hand. I have searched the works on obstetrics and cattle practice which were available to me, and although the authors talk glibly about douching the uterus, until the more recent work by Williams (7) I was able to find but scant explanation of the technique by which it might be accomplished. I am of opinion that very soon after parturition it is impossible to douche the uterus without *suitable equipment* in the way of uterine forceps to retract the uterine-cervix, and convenient catheters to syphon out the débris, and for modern work it will be as necessary for us to spend these to our equipment as it is to carry a milk fever outfit or a stomach tube.

On vaccine therapy I have nothing to say, except that, as far as I can ascertain, experiments with the organisms concerned have given negative results.

Before concluding this brief resumé of metritis, I think the removal of the *corpus luteum* should be mentioned as a probable valuable asset. Time and space will not allow me to go into this matter. I cannot do better than to quote from Boyd (9). He says: "The veterinarian who is expert in the treatment of sterility fully appreciates the value of the

dislodgment of the *corpus luteum* in the successful treatment of pyometra." He further says: "The *corpus luteum* bears a close relationship to both œstrum and the involution of the pathologic uterus and the veterinarian who is doing cattle practice, if not already familiar with the working of this gland of internal secretion, should immediately familiarise himself with it, for not only will it increase his activities as a cattle practitioner, but his clientèle will be more appreciative of his ability, and his services in other fields of practice will be more eagerly sought for."

LITERATURE CITED.

1. F. T. HARVEY on a valve-like arrangement sometimes met with in Diseases of the Uterine Cervix of Cows. *Vet. Record*, March 4th, 1922.
2. J. T. EDWARDS. Bovine Abortion and its Control. *Vet. Record*, December 17th, 1921.
3. D. C. BEAVER. A Contribution to the Bacteriology and Pathology of Sterility in Cows. *J. A. V.M.*, August, 1922.
4. G. W. GRIMM. Treatment of Retained Placenta in Cows. *J. A. V.M.*, June, 1922.
5. H. B. GROOME and MCCOY. Bovine Sterility and its Treatment. *J. A. V.M.*, September, 1922.
6. H. C. REEKS. A few Notes on Foaling Cases and their Sequelæ. *Vet. Record*, April 1st, 1922.
7. W. L. WILLIAMS. Diseases of the Genital Organs of Domestic Animals.
8. REISINGER, HELLER and VERSINGER. Treatment of Septic Metritis with Charcoal Abstract. *J. A. V.M.*, September, 1921.
9. W. L. BOYD. The Relation of the *Corpus Luteum* to Estrum, and Involution of the Pathologic Uterus. *J. A. V.M.*, October, 1921.

DISCUSSION.

Major G. W. DUNKIN, in opening the discussion, said: We have listened to-day to a description of a condition very frequently met with in all spheres of veterinary practice, and Mr. Gunning is to be congratulated, firstly, on selecting a subject which every practitioner meets with at some time or another in his career (and rarely without some misgiving as to what sort of termination is likely or probable), and secondly, for the comprehensive way he has dealt with it.

There are many ways of opening a discussion on a technical paper, but whatever way one selects will come under one or other of two headings, destructive and constructive. In some respects it might be considered advisable to adopt the former method of discussion, by reason of the fact that many points in connection with the condition under review are not mentioned, but, before doing so, one must read the title and then one's destructive criticism will be greatly modified. It will have been obvious to everyone here that Mr. Gunning has read deeply into this subject, and, further, that he has studied it carefully from the practical point of view. In this connection I would mention one point in his paper, I refer to his quotation of Beaver's, who states that "retention of the placenta is a vital contributing factor"—I take it that Mr. Gunning agrees with this observation—but later on he says, "it is well known the resistance which a bovine animal has to putrefactive organisms within the uterus, even a decomposing placenta, etc."

With this latter view I am inclined to agree. Further, I would go as far as to say that such a condition would tend somewhat to obviate such cases as Mr. Gunning has cited in the first part of his paper. The retained placenta would necessarily tend to keep open the *os* and so allow the results of putrefaction to escape.

I am in entire agreement with the author when he says that he does not agree with the use of indiscriminate injections of strong antiseptics. De Bruin advises that in any case, and whatever one introduces afterward into the uterus, one should first wash out the organ with clean warm water.

The whole of the paper seems to have been concentrated on cases of metritis met with in connection with *parturition*. It has been my misfortune to meet with one or two cases in the smaller of the lower animals which were certainly not in any way due to the effects of parturition, in so far as the patients were virgins. In each case the *os* was partially open, and a thick pale yellow discharge was apparent from the vulval opening.

In neither case was irrigation successful, and the patients, so far from recovering, got gradually worse, constitutional symptoms setting in, so that it was decided to operate. In each case the walls of the uterus were much thickened and showed a considerable catarrhal exudate, and the organ itself was about half-full of the purulent matter referred to. In one case there was an uninterrupted recovery, while in the other, death took place in about twenty-four hours subsequent to the operation, from peritonitis.

Mr. ROBERTS thought some of the cases were difficult of diagnosis. He had much confidence in the treatment with carbolic acid internally for these conditions.

He thought Johne's disease often developed after parturition.

Mr. DIXSON said he thought diagnosis was not difficult with the offensive smell and the characteristic discharge which was usually present.

In the smaller animals, with chocolate-coloured discharge, he considered surgical measures were best, *viz.*, amputation of the uterus.

Mr. GULLEFORD said he remembered when practising in the Fens years ago that these cases in mares were treated with strong doses of calomel and opium, and fever drenches—including tincture of aconite, together with fomentations to the abdomen, and sinapisms. He feared they lost a considerable number. His treatment was not so drastic in these days. He always looked first to the womb, removing the placenta and irrigating the uterus with a weak solution of cyllin by means of a Reid's pump, repeating when necessary. Also fever medicine and a mild purge were employed, and he usually found there was an early fall of temperature.

It was wonderful what a cow would put up with in the way of an offensive after-birth or womb;

perhaps she would feed and chew the cud, and fill the milk pail all the time.

The HON. SECRETARY said he was of opinion that irrigation of the uterus was more of a preventative of metritis in cases of retained cleansing than a curative of the active condition. He usually removed the nozzle of the pump, carried in the rubber tube, and irrigated the uterus with an antiseptic solution, and, where he was suspicious of inflammatory conditions, removed the greater part of the fluid by the other end of the pump to avoid trouble from straining.

He repeated the flushing if conditions were very offensive. He was of opinion, however, that it was in the early stages that the procedure was most valuable. He had also used pessaries in the more severe conditions.

The PRESIDENT said he would like to ask Mr. Gunning if he had met with many cases of metritis in the mare and had found laminitis to be a common sequel. He considered pessaries were very beneficial and he also had great confidence in the carbolic acid treatment.

He believed in the removal, if possible, and as easily as practicable, of the placenta by careful separation from the cotyledons, but much deprecated the practice of attaching a weight to the placenta, which was common with some owners in some parts.

He thanked Mr. Gunning for his useful paper.

THE REPLY.

Mr. GUNNING said he wished to thank the members for the kind manner in which they had received his paper. He had thought it deserved a little more criticism than it had received, because the object of his paper was a selfish one. He was not an authority on the subject, and he wanted to receive that day rather than to give knowledge.

He would first reply to Major Dunkin, who suggested that in a way his remarks were contradictory, firstly stating that bovines had a remarkable resistance against putrefactive organisms in the uterus, later by emphasising the necessity for treatment. But he did not think it was contradictory, for while the cow had this undoubted resistance, yet from a public health standpoint, and also for retaining the breeding efficiency of the animal, it was most necessary to adopt curative treatment. Regarding Major Dunkin's question as to an explanation of cases of metritis in non-parturient animals, Mr. Gunning said he had never come across any white heifer disease, which he supposed was the condition referred to.

Mr. ROBERTS: It is very common in the West of England.

Mr. GUNNING said Major Dunkin spoke about metritis in small animals. He (Mr. Gunning) said his experience in that direction was not very great, but he was of opinion that where the underlying structures were involved, the only thing to do was to amputate. Major Dunkin had further asked the predisposing cause. This, in his opinion, was a very difficult question to answer, except in so far that abortion lowered the resistance. It was emphasised in a paper read by Mr. Nelder some months ago in the Western Counties, that cows calving normally had died in a few days from infection of the uterus (so-called) after cleansing, but he (Mr. Gunning) was at a loss to account for it, unless it was owing to retention of the debris.

Mr. GULLEFORD: Due to premature closing of the *os*.

Colonel Baldry had said that Johne's disease could be easily eliminated. Mr. Gunning personally did not think so. He had in mind a herd of dairy cattle where three different specimens of the intestine were sent for bacterial examination, but it was not until the third occasion that they found the organism.

Colonel BALDRY said he had in mind the serum test.

Mr. GUNNING, continuing: Mr. Dixson had asked about diagnosis; he was of the same opinion as Mr. Roberts, that diagnosis was very difficult. He (Mr. Gunning) asked Mr. Dixson if he thought there was a characteristic odour.

Mr. DIXSON: Yes.

Colonel BALDRY: Those cases did not require much diagnosis, but in a case where the uterus was closed, with up and down temperature and practically no discharge, the difficulty was to make up one's mind as to whether it was Johne's disease or metritis. They could eliminate Johne's disease by the serum test.

Mr. GUNNING thought the expense of the serum test might be an obstacle.

Colonel BALDRY: Would you advise forcing the nozzle of a catheter into the uterus in cases of doubt?

Mr. GUNNING: I should have no hesitation in carefully exploring with a small catheter.

Colonel BALDRY: I was rather labouring the point because of the difficulty of getting some cows in calf again. I am wondering whether the metritis has anything to do with sterility.

Mr. GUNNING: I think it has; you cannot separate sterility from metritis.

The CHAIRMAN: Have you tried dosing with carbonate of soda?

Mr. GUNNING: I tried once recently as a last resource, and the cow came in calf.

Mr. ROBERTS: I think it is very useful.

The CHAIRMAN: Do you refer to internal administration?

Mr. ROBERTS: No, only to local treatment.

Mr. GUNNING: Mr. Roberts asked if it was possible to dilate the *os*. I think it is usually possible to introduce a small catheter.

Mr. ROBERTS: Do you have any difficulty in getting the solution out again?

Mr. GUNNING: As long as the catheter is retained you can massage it out per rectum.

Mr. GULLEFORD: After you withdraw the catheter does the *os* close up again directly?

Mr. GUNNING: Not entirely; it is easier to dilate next day.

Mr. GUNNING said he was very interested to hear Mr. Gulleford's remarks regarding douching the uterus as he was a practitioner of long experience. He thanked them again for the kind way in which they had received his paper.

A complete set of the equipment referred to in the paper was subsequently inspected and commented on by the members.

The Etiology of the Free-Martin.

A Brief Account of Recent Work by Frank R. Lillie, University of Chicago.

I. The Facts. It is well known by breeders, and indeed by farmers generally, that a heifer born twin to a bull calf is usually sterile. Such heifers are known as free-martins, a term so old that its origin and etymology are uncertain. The fact that females of two-sexed twins are occasionally normal, and that one-sexed twins are regularly so, has made the problem of the etiology of the free-martin an unusually difficult one. Its solution has, however, been attained independently by the writer and by Keller and Tandler in Vienna. As these studies appear to be unknown generally to the veterinary profession in this country, a brief summary of them is given here by request of Dr. C. P. Fitch, of St. Paul. Those who wish to examine the subject critically will, of course, consult the original publications.

It may be assumed that the readers of this journal are familiar with the general characteristics of the free-martin. It should, however, be noted that the internal anatomy is so definitely male in its main characteristics that anatomists have frequently classified the free-martin as a male individual, contrary to the ordinary commonsense interpretation of its sex. The internal characteristics that have led to this determination are the nature of the gonads, more like testes than ovaries, a not infrequent descent of these organs into the skin beneath the groin, though scrotal sacs are absent, the usual presence of vasa deferentia and seminal vesicles, and the usual absence of vagina, uterus and Fallopian tubes. In spite of these internal characters of the male type, the external characters are usually typically female, though in rare cases aberrations towards the male type occur.

However, the embryonic development and the sex-ratios, which have been studied by the writer, furnish conclusive proof that the original sex-determination of the free-martin is female (see references in literature).

It is essential to recognise the fact that the free-martin is found only in association with a bull twin. The association with a male *in utero* is, therefore, in some way a necessary condition of the phenomenon. It is also an invariable rule that the male twin is normal; the reverse condition of a normal female associated with a defective male does not occur. Genital abnormalities may of course occur apart from twinning, but we are not here concerned with such cases.

The theoretical interpretation of the free-martin must be based on one of two assumptions, either (1) that it and its partner are derived from a single ovum, *i.e.*, that they are identical or monozygotic twins, or (2) that they are derived from two distinct ova, *i.e.*, that they are fraternal or dizygotic twins. Under the first assumption, as the sex of monozygotic twins is identical, the free-martin would necessarily be interpreted as a modified male. Under the second assumption, it would be equally a matter of necessity to interpret it as a female, for there is no possibility that the association of two males *in utero* should cause the transformation of one of them into a free-martin.

Keller and Tandler report 91 cases of twins of cattle examined *in utero* in which the ovaries of the mother were available for examination. The writer reported 94 cases of cattle twins examined *in utero*, but in only 36 of these cases were both maternal ovaries available for examination. In the 127 cases where the maternal ovaries were examined, two *corpora lutea* were found 126 times, generally one in each ovary, sometimes two in one ovary, and none in the other. There was one case of twins in my collection (both females) in which there was but a single *corpus luteum*. It is possible, but not certain, that this is a case of monozygotic twinning. However, in all cases of two-sexed twins observed, two ova had been concerned.

Thus, the assumption that the free-martin and its bull twin are identical twins descended from one fertilised ovum becomes untenable, and with this assumption disappears also the theory of the male sex of the free-martin.

Examination of the fœtal membranes in cases of twin pregnancies in cattle has shown that the membranes of the two individuals fuse when they come in contact, and that, in the great majority of such cases, anastomoses arise between the umbilical arteries of the two partners or between branches of them. This results in constant inter-mixture of blood of the two fœtuses. The exact data are given in the papers of the writer. The single figure here given will give a clear idea of the condition.

The writer has studied the time of sex-differentiation in embryos of cattle, and has correlated it with the time of vascular anastomoses of the membranes in twin pregnancies. He has found that sex-differentiation can be distinguished by the microscopical structure of the gonads at a stage of 25 millimetres greatest length of the embryo, and that it is well marked internally and externally at 30 mm. The membranes are sufficiently well developed for fusion at about 20 mm. length of the embryos, when the pregnancy is two-sided, and much earlier of course when it is one-sided. He has an actual case of completely fused twin membranes with embryos of about 3·75 mm. (paper in press—Biological Bulletin). There is little doubt that in some cases exchange of blood between the twins begins at about 25 mm., but it is probable that the time at which it begins is variable.

The condition of the free-martin could, then, be explained on the assumption that the male twin, but not the female, produces its sex-hormone at an early embryonic stage, and that it passes through the vascular anastomoses into its female partner and there produces those conditions characteristic of the free-martin.

III. Theory. This theory would present the following questions: (1) How does it happen that some heifers twin to a bull are normal? (2) Why are two-sexed twins in other mammals (*e.g.*, sheep regularly normal? (3) What is the evidence that the

male produces a sex-hormone so early in embryonic life and the female does not ?

(1) The first question is answered by the fact that in rare cases the membranes of the twins either do not fuse, or the fusion is slight, and no vascular anastomoses are formed. In such cases both individuals are normal. I have reported six such cases, and Keller and Tandler six also. These cases constitute a veritable control experiment which is conclusive. In all the cases examined by us in which vascular anastomoses are formed, the female of two-sexed twins is a sterile free-martin. These cases together now number 114. In all cases in which such vascular anastomoses fail the female of two-sexed twins is normal. There are 12 such cases on record. These cases thus lead to the expectation that about one heifer out of nine twinned to bulls will be normal. They prove conclusively that something carried in the blood of the male is responsible for sterilisation of the female.

(2) In other mammals two-sexed twins, and associated individuals of opposite sex in cases of multiple births, are usually normal, because vascular anastomoses usually do not form between the embryonic membranes of a pair or litter. In swine it is not at all uncommon for the embryonic membranes to fuse more or less intimately, but it is exceedingly seldom that vascular anastomoses develop. In the sheep the membranes generally fuse in twin pregnancies, but there are no vascular anastomoses between the partners. Keller and Tandler have made the same determination for goats, in which genital abnormalities appear usually at least, to be due to other causes. In the case of human twins vascular anastomoses form only between identicals derived from a single ovum, and thus genital abnormalities do not arise, for the sex of such twins is the same. Cattle appear to be peculiar in respect to the general occurrence of vascular anastomoses between partners. It is, however, probable that similar cases occur *very rarely* in the case of some other mammals.

(3) The proof that the abnormalities in the free-martin are due to substances present in the blood of the male twin is conclusive. As the resulting abnormalities concern only the reproductive system and secondary sex characters, the conclusion that a sex-hormone is concerned seems unavoidable. Steinach's and Moor's experiments show that grafting the sex-gland on a castrated individual of the opposite sex in rats and guinea-pigs produces heterosexual characters of a very pronounced kind. The case of the free-martin differs from these only in the fact that the influence of the heterologous sex-hormone begins early in the embryonic life instead of after birth, and hence has a correspondingly greater effect. The ovary of the free-martin is the first thing to succumb to the male hormone, so the female is essentially castrated, and the full effect of the male sex hormone is felt on the other developing organs of the female.

Another argument comes from the histological side. The production of the male sex hormone is attributed by histologists and physiologists to certain cells, called interstitial cells, or cells of Leydig, found in the parenchyma of the testis between the tubules. If this opinion is correct, such cells should be formed very early in embryonic life to agree with our theory of the free-martin. Mr. K. F. Bascom working in my laboratory has shown that this is the case. Interstitial cells of the same character as those of the adult filled with secretion granules appear in the testis at a stage of about 30 mm. greatest length of the embryo, but they do not appear in the ovary until near the time of birth. The occurrence of interstitial cells thus runs exactly parallel to the phenomena and the theory.

Finally, as regards evidence for the theory, I may add that another of my students, Dr. T. Minoura, has produced free-martin conditions artificially in chicks by grafting pieces of testis tissue on the allantoic membrane of growing embryos.

III. There is no practical means of prevention. One-sided ovariotomy would prevent much twinning, if it did not result in hypertrophy of the remaining ovary, but the cure would certainly be worse than the disease.

Additional work has been done in our laboratory on the microscopic structure of the sex-glands in the embryo (Chapin) and in the adult (Willier). The complete absence of any ovarian cortex, and the high degree of development of the male rudiments—tubules, rete, epididymis—are the outstanding features. The tubules are, however, entirely devoid of spermatogenetic tissue, and their lining is made up entirely of supporting or Sertoli cells. Other work dealing with the exact nature of the changes produced by the male hormone in the female embryo is in progress.

The phenomenon is of the greatest interest to the biologist as giving a measure of the probable maximum effect of sex-hormones in transforming sex. It would appear that sex-determination as expressed in the zygote is probably not completely reversible, and that, therefore, the question of controlling the determination of sex and sex-ration cannot be approached through the hormones. — ***Cornell Veterinarian.***

R.S.I. Meat Inspection Examinations.

At an examination for Inspectors of Meat and other Foods, held at Liverpool on December 1st and 2nd, 1922, fourteen candidates presented themselves, and the following seven candidates were awarded certificates :—

Griffiths, E. D., *Wrexham*; Harding, A. J., *Hull*; Hauldren, A. B., *Crewe*; Jepp, J. W., *Leeds*; Oversby, V., *Bradford*; Parry, T., *Wrexham*; and Pollock, T. E., *Barrow-in-Furness.*

E. White Wallis, *Deputy Registrar.*

The life of a kitten which fell down a deep well at Headley, Hants., was saved in a remarkable manner. After two unsuccessful attempts had been made to recover the kitten in a bucket a police constable lowered the mother cat, which at once seized the exhausted kitten and held on to its neck until both had been pulled up.

Foot-and-Mouth Disease History.

Writing in the *Journal of the Royal Agricultural Society of England*, Mr. James Howard gives the following informative account (as reproduced by the *Live Stock Journal*) of the history of foot-and-mouth disease and of its occurrence in this country.

In the very first volume of the Journal of the Royal Agricultural Society (1840), there appeared a report on the "Recent Epidemic among Cattle," a complaint subsequently termed foot-and-mouth disease. In the following year, 1841, the Journal contained a further report from the Veterinary Committee of the Society, which it appears had been instructed to institute an inquiry among the members of the Society as to the origin of the epidemic, its symptoms, and the remedies to be applied.

The information collected by the Committee established the fact that the disease was a new one, and had not been known in Britain before the summer of 1839. Viewed in the light of our present knowledge, many of the opinions broached as to the origin of the disease are most amusing, and some of them very absurd; moreover, none of the opinions expressed gives evidence of any sound knowledge of the habit and course of the contagion; and this remark equally applies to those who were looked up to as authorities for guidance.

As the first volume of the Journal contains an account of the introduction of a disease which has entailed such wholesale loss and trouble, it appeared to the writer that it would be appropriate to place upon permanent record an account of the experience gained of the formidable malady.

The old veterinary books afford evidence that the complaint was unknown in England before 1839; for, in describing the various diseases to which the animals of the farm are liable, the writers made no mention of foot-and-mouth, or any disease akin to it. Thus, in Pearson's "Horse, Cattle and Sheep Doctor," published in 1811, sixty diseases of cattle and sheep are described, but there is not a word upon foot-and-mouth. In the earlier editions of Clater's "Cattle Doctor," no mention whatever is made of the disease; but in 1853, when the tenth edition was published, the following remarks occur: "Since the eighth edition of this work was published, a new disease (foot-and-mouth) has appeared among cattle and sheep, and for the last twelve years has spread through the kingdom, scarcely sparing a single parish."

When "the distemper" was first publicly reported to exist in dairies situated in the environs of London—viz., in July, 1839—the English veterinarians of the day appeared to be totally unaware of the nature and history of the malady, and wrote of it as a novelty and a wonder; some of them suggested that it might be due to peculiar atmospheric influences. This want of knowledge was remarkable, for in December of the previous year, 1838, a paragraph had appeared in the London newspapers announcing that an "epidemic disease prevailed at this time amongst cows in the neighbourhood of Houdan and Pontchatron, in France, large swellings appearing on the feet to such an extent as to prevent them from walking: the animals lose their appetites, and foam greatly at the mouth." Again, in November, 1839, the *Farmer's Magazine* contained a letter from a German correspondent in Mecklenburg, expressing surprise that English veterinarians should be ignorant of a disease which had been known on the Continent for several years. He stated that it came from Poland, through Pomerania and the Marshes of Russia, reaching Mecklenburg in the spring of 1838. Professor Fergusson also appeared to have had some experience of the malady, for, in a lecture to the Royal Dublin Society in 1841, he stated: "In the year 1836, while I was attached to one of the Continental veterinary colleges, the disease attracted my attention from its great prevalence and destructive effects among the herds of the neighbouring hamlets. Although new in this country, the present epizootic had travelled through Spain, Portugal, France, Switzerland, Holland, Belgium, Bohemia, Hungary and Prussia, previous to making its appearance in England, which it seems it did, on the western coast, about two years ago."

Further, a paper by Dr. Gilmeister, veterinary surgeon, of Bavaria, read by Mr. Erne before the Veterinary Medical Society in May, 1840, showed that foot-and-mouth disease prevailed in Hungary and Lower Austria in 1834; that it spread rapidly to Bohemia, Saxony and Prussia, afterwards to Mecklenburg, and also through Germany, Holland and France.

The inference is plain that foot-and-mouth disease overflowed into England from the reservoir of contagion in Europe. Whether it appeared first in our west coast, as Professor Fergusson stated, or in the suburbs of London, as was first reported, the malady certainly came at a time when the importation of live animals was prohibited by law, the prohibitive statute not having been repealed until July, 1842.

With our present knowledge we can readily understand how the contagion might have arrived by mediate conveyance; for, disregarding the teaching of Dr. Layard, who, as far back as 1747, urged, respecting another foreign "murrain," that of all cautions, prohibiting the importation of infected cattle and hides is of the greatest importance, so foolish and ignorant were we at this period that, whilst foot-and-mouth disease was raging on the other side of the German Ocean, we were all the time importing "untanned foreign hides," not disinfected in any way. In 1838, the imports of such hides amounted to 346,348 cwt.

It is quite possible that the contagion reached our shores by a diseased animal, for, although prohibition was the law, it was very common for milch cows, brought for the ship's use, to be seen at our ports, where there was often no obstacle to prevent the sale of such an animal. Or, it may be true, as has been stated, that Professor Youatt traced the first outbreak of the malady to certain diseased specimens of the bovine species imported for the Zoological Gardens in 1839, immediately after which the complaint was discovered at Stratford, in the suburbs of the Metropolis, whence some diseased animals were sent into Smithfield Market. In the next month, September, the disease was discovered, not only in the Smithfield Market, but among cattle near Loddon, in Norfolk. From various centres the infection was carried into Scotland and Ireland; so virulent was the disease that it is recorded, "baskets-full

of hoofs of swine and sheep were often swept up after the Smithfield Market was over."

That the formidable disease was, with so much complacency, permitted to exist in our midst for the long period of forty years seems, with our present knowledge, simply astounding. There is no reason for believing that these Islands were ever completely clear of the contagion, from the date of its first introduction until the year 1880.

The first invasion of the contagion, in 1839, reached the height of its ravage, in 1840 and 1841, followed by two years of decline; the second outbreak occurred in 1845; the third in the latter part of 1849, lasting over the year 1852. A considerable period then elapsed before another accession took place—viz., in 1861; and after 1863 came a period of quiescence lasting for a year and a half. In the middle of 1865 began the fifth spread of the disease, and this occurred simultaneously with the invasion of rinderpest.

The strict measures applied against cattle-plague (rinderpest), in 1866, had the effect not only of checking the course of foot-and-mouth disease, but also of opening the eyes of farmers to the fact that the troublesome complaint was amenable to vigorous measures for its suppression; for, although it was not entirely extirpated at that period, very few centres remained in 1868. The sixth outbreak, which set in during 1869, proved to be an exceedingly severe visitation; between August of that year and the close of 1871, there were officially reported in Great Britain 92,162 outbreaks and 1,344,525 animals attacked.

Official returns were discontinued in 1872, but the disease only began to decline in intensity toward the latter end of that year, and the Veterinary Department reported that, "considering the comparatively slight attention which was given to the subject of sanitary regulations in regard to foot-and-mouth disease at that time, it is probable that the actual outbreaks were double the number of those that were reported." Three or four million cattle, sheep and pigs, smitten with the disease in the three years, may easily have destroyed, directly and consequentially, eight to ten million pounds sterling of agricultural capital.

After a lull in the prevalence of the contagion, it rapidly increased in 1874, beginning, however, to decline again in the autumn of 1875. The eighth outbreak occurred in December, 1876, and had spread over considerable parts of England, Wales and Scotland before the cattle-plague (rinderpest) restrictions, imposed in 1877, checked the course of the mischief; so effectual did they prove that, by the end of 1878, only two centres were known to the Veterinary Department in Great Britain. The ninth outbreak, early in 1879, was met by restrictive measures, and happily was stopped before the contagion had obtained any grasp of the country, and during the first nine months of 1880 the kingdom was absolutely free from the disease.

Although it cannot actually be demonstrated that germs of the contagion survived in some protective concealment throughout the spring and summer of 1880, and these with sufficient vitality to start the disease again in the autumn, the hypothesis that such germs were so preserved, and that they did start again into activity, not before, but just after infected animals had imported a new stock of the contagion from France, is so monstrous a fitting of theory to fact to serve a purpose that it cannot for a moment be entertained.

The first case of foot-and-mouth disease in 1880, outside a foreign cattle market, was detected on October 1st in a dairy in the City of London; and immediately afterwards reports of the existence of the disease were received by the Veterinary Department from Bedfordshire and Kent. Surrey, Essex, Norfolk, Lincolnshire, Buckinghamshire, Leicestershire and Nottinghamshire were quickly invaded, and by the end of the year the contagion was extensively spread. Hence it clearly appears that whilst foot-and-mouth disease broke out in London at the end of September, no re-importation of the contagion could have escaped inland from any of the infected cargoes which had been landed at English ports and safely slaughtered, between January 1st and the middle of September, 1880, at which period an arrival at Deptford of infected French animals was speedily followed by the outbreak in a London dairy.

The chain of evidence is complete, and the fact demonstrated that the regulations in force at Deptford Market, which failed to prevent rinderpest from travelling inland from its landing-place, in 1877, also failed in 1880 to intercept the subtle foot-and-mouth contagion. Thus, in the middle of September, 1880, the Inspector of the Privy Council, at Deptford, had his attention called to signs of foot-and-mouth disease in the tongues of some French cattle which had been slaughtered in the market. A portion of the lot had been disposed of before the authorities became aware that the infected animals had been in the lairs of the market, in which place they might have been freely handled by persons attending both Deptford and the Metropolitan Home Cattle Markets on the same day. Here was one obvious channel by which the contagion might have escaped into London.

On September 20th, a cargo of cattle from Havre was landed at Deptford, and by "the second day after landing"—*i.e.*, before adequate precautions had been put in force to intercept possible contagion among the animals—they were inspected, when some of them were found to be affected with foot-and-mouth disease: by that time the contagion could have, indeed had, been carried past the precincts of the market. The official report of the Veterinary Department afforded specific information on this point; it stated that "Consignees and others who have business at Deptford conduct their affairs on a large scale, and the dealer who handles diseased animals in the morning at Deptford may, in a few hours, be touching animals standing in a market many miles distant, and thus unwittingly become a means of disseminating the infection." It happened in the case of the outbreak of foot-and-mouth disease in the City that a possible channel for the conveyance of the infective matter was recognised. A few days before the disease appeared, a butcher, who had premises at Deptford, visited the City dairy and endeavoured to arrange for the purchase of a fat cow. Further, it appears that the state of the diseased animals in that dairy proved that the infective matter must have been introduced some time previously to the discovery of the disease. Great quantities of the virus were generated in Deptford Market, for, at the time of the importation of the diseased cattle,

the lairs happened to be so overcrowded that no opportunity was afforded for effectual disinfection of the places contaminated by the disease.

An outbreak of foot-and-mouth disease was once known to occur on the premises of a butcher in the town of Deptford, which was traced to the circumstance of his pigs having eaten the intestines of diseased sheep, which had been killed in the Deptford Foreign Cattle Market. Then there is a vehicle of transmission of contagion by means of hides, nominally disinfected, but not always absolutely safe. In 1881, Mr. James P. Heath, Veterinary Inspector for the County of Devon, adduced facts proving the conveyance of the disease by hides. Another medium for the introduction of the disease consists in the removal of timber fittings and pens from cattle-carrying vessels, which are often sold to carpenters and others in this country; then, again, the manure out of such vessels is a still more likely medium for the spread of contagion.

Foot-and-mouth disease was carried over the border into Scotland in March, 1882, after that division of the kingdom had enjoyed total immunity since 1878. A second introduction occurred early in 1883, brought by cattle directly from Ireland, where the disease had gained a footing.

The evidence gathered at the time showed conclusively that Ireland, which had for a very long period been perfectly clear of the disease, was infected by a bull imported by Lord Carbery from Westmorland, and shipped at Liverpool. It would be a most singular coincidence that the contagion entered Ireland simultaneously with the bull, but was conveyed in the dress of drovers who had been attending markets in affected districts of Lancashire: this, moreover, was the official theory, but it must be remembered that the same drovers had been constantly going backward and forward. It may be admitted that the bull had not contracted disease in his native country, as he was purchased of the Rev. F. Staniforth, of Storr's Hall, Westmorland, and no foot-and-mouth disease had been known in the neighbourhood for years; nor at the time the animal was sent away did the disease exist in the county. The bull was shipped from Liverpool, and doubtless became infected during transit either on the rail or on board ship. The course of this entrance of the disease into Ireland, as gathered from the facts published at the time, was that the bull arriving in Dublin on January 17th, 1893, showed symptoms of the complaint on the 22nd; the infection was carried to yards where pigs were feeding, probably by the mediate agency of veterinarians; some of these pigs were exposed in Dublin Market, and were afterwards found diseased on the quay, awaiting shipment for England; and a number of store cattle, from the store market alongside the pig market, were driven to the shipping yard where the imported bull had been landed, and where the diseased pigs had been found; these cattle were thence embarked for Glasgow, where they landed on February 4th, and were found diseased two days later at Edinburgh.

A Committee of the Cabinet is to consider the whole question of the use of mechanical slaughtering instruments, and it is hoped as a result they will order a thorough inquiry to be held.

Performing Animals.

Dealing editorially with this matter *The Times*, in a recent issue, says, "We hope that in the next Session of Parliament time will be found by the Government for passing a Bill to regulate the training and exhibition of performing animals. Last year a Bill to prohibit the exhibition of performing mammals and birds was negatived on the third reading, largely because it went beyond public opinion. Dr. Addison had already informed the Standing Committee that Government support would be withheld because the Protection of Animals Act, 1911, had proved its efficacy. But even in those days Dr. Addison had to bow before facts. So great a weight of evidence was produced that a strong Select Committee was appointed to inquire into the conditions of training and exhibition of performing animals, to consider whether legislation, prohibitive or regulative, were desirable, and, if it were found to be desirable, to suggest its lines. General Colvin, the chairman, and his colleagues did their work carefully and well. Their Report, published last May, contains more than sufficient grounds for immediate legislation and a clear indication of the lines which it might follow. We accept, although with reluctance, their decision that the time has not yet come for total prohibition of this particular exploitation of animals for the pleasure of man. We are ready to believe that both trainers and proprietors of exhibitions are more anxious than formerly to avoid cruelty, and that spectators are less tolerant of performances cruel in themselves, or with cruelty behind them. But it cannot be doubted that there are still many cases of ill-treatment and wanton cruelty in the training and the performances against which the existing law is wholly insufficient to provide. Regulation is necessary. But it must be instructed and alert. We agree, therefore, with the recommendation to establish a permanent Committee of Supervision, with statutory power to prohibit, restrict, suspend, or modify the performance or training of animals. We agree, moreover, that all places of training or of exhibition should be registered and should be open to inspection at any time without notice. The prohibition of the training and performances of chimpanzees and other anthropoid apes, and of the use of mechanical contrivances involving cruelty to animals in conjuring tricks, and the need of increasing the penalties for all cruelty to animals were thoroughly justified by the evidence. We are more dubious as to a distinction drawn by the Committee between the larger carnivora and 'more domesticated and docile animals, such as dogs, cats, horses, seals and birds, elephants, and kangaroos.' Powerful and dangerous animals were commended to the special attention of the Committee of Supervision, the presumption apparently being that cruelty was less likely to be inflicted on animals less capable of resenting it, or that lions and tigers were less responsive to kindness than cats and dogs. The distinction should be omitted from the new Bill; every animal which it is proposed to train and to exploit requires the fullest protection that the law can give, and if we had to make a choice it would be in favour of the safeguarding of creatures which by domestication or by nature are most within the power of man."

The Veterinary Record.

30th December, 1922.

Clinical and Case Reports.

The Editor will be glad to receive from members and others contributions to this column of reports of interesting cases

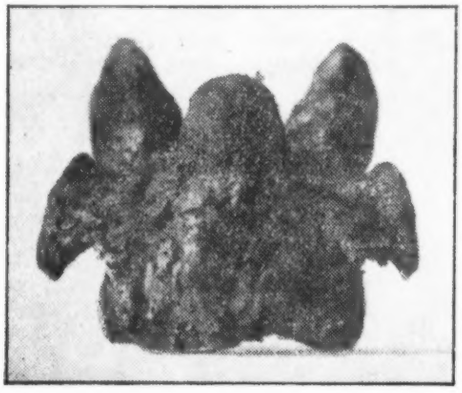
Equine Vertebral Disease.

By W. E. Blackwell, M.R.C.V.S., Towcester.

Subject.—Grey nag, 13 years old.

History.—The horse had been in its present owner's hands for three weeks when I first saw it. During the last week it had been quite unfit for work of any kind, though it had run in a baker's cart the two previous weeks. During the whole of that time it was noticed to carry its head on one side, and to be slightly lame on the off-fore leg. The reason for its total incapacity during the third week was this: whilst attempting to drink from a pail placed on the floor in front of it, it suddenly pitched forward and its head came into rather violent contact with the wall, producing two or three nasty bruises on the forehead.

Symptoms.—At rest in the stall, the horse stood exactly as if he was suffering from acute laminitis. His fore legs were stretched forward and his nose was poked out, but his head was slightly lower than normal. When made to walk he was very stiff, but kept his nose in the same position. Placing the right hand just above the nostrils and pressing the left one into the base of the neck on the off side, one could make the horse kneel down if one bent the neck to the right. A blow over the base of the neck would produce a similar effect. When made to trot in a field the horse turned a complete somersault. There was much pain over the base of the neck, but no appreciable heat or swelling.



Diagnosis.—Vertebral disease at the base of the neck. I advised slaughter.

Post-Mortem.—The horse was sent to the "kennels" here. I did not attend the autopsy, but arranged for the bones of the neck to be sent on to me in a sack, which was done. Six of the bones were all right, but the seventh was extensively diseased, as shown in the accompanying photograph.

There was no fracture. There existed extensive caries of and around the anterior articular processes. Sir John M'Fadyean very kindly examined the bone, and informed me that it was very similar in appearance to what he had seen in cases of tuberculosis in the horse.

Remarks.—I regret now that I did not test the animal, but I confess I was not quite sure as to whether a horse infected with tuberculosis would give a positive reaction after being inoculated with bovine tuberculin. I have since learned that the answer to that question is in the affirmative. I think vertebral disease in the horse is not rare. I can recall three cases within the last few years. One was an old horse. The owner had purchased it from a dealer only a few days before I saw it. He told me it was in good condition when he bought it, and that it had fallen away "like butter in the sun" since he had turned it out to graze until he wished to use it. The horse could feed from a manger, but could not get its head down to the ground to graze, hence the loss of condition.

Another one was a fine five-year-old cart mare. She was noticed grazing whilst lying down, and she was obviously losing condition. I examined her and found the usual inability to lower the head further than the height of an ordinary manger. There was no history whatever.

I enquired if she pulled violently backwards when tied up, as some horses do, so much so that they get cast sometimes, and simply hang there and struggle. Injury to the vertebræ might easily result from that cause. She was free from that fault.

The only conclusion I could come to here was that the mare had been rubbing in the fence somewhere, and got her head fast that way. In this position she would probably pull back quickly, get frightened, and make strong efforts to liberate herself, with resulting injury to the neck. Feeding from a manger, rest, liniments and blistering had very little effect, and the owner turned her out to take her chance after six or seven weeks of this ordeal. There was here no paralysis, deformity or other sequel during that period. I do not know whether she recovered or not, but I intend to find out if possible.

Amputation Cases.

By R. P. Jones, M.R.C.V.S., Ruthin.

"*. . . Amputations are relatively less important in Veterinary Surgery. The saving of life by amputating a diseased or seriously injured limb is not a mission of Veterinary Surgery, except here and there, in a dog or cat, whose leg has been crushed, and occasion-*

ally in a pregnant mare or cow carrying a precious fœtus as an object of salvage. The large animals, however, seldom ever survive the loss of a limb, and, furthermore, they are useless without all four, while the small pet animals, being looked upon as objects of pity, when a leg is lost, are usually painlessly killed. Hence the small importance of limb amputations in domestic animals."—"Merellats' Veterinary Surgical Operations."

Veterinary text books, as a whole, pay no attention to amputation of the limb in the lower animals, or dismiss the subject in discouraging words such as those quoted above.

Compound fractures frequently occur in cattle. They necessitate the adoption of one of two courses, either slaughter of the animal for food, or treatment by amputation of the limb.

With cattle in good condition, the former is the economic solution. It frequently happens, however, that such fractures occur in young stock in lean condition, which cannot be disposed of in this manner. In such cases there should be no hesitation in resorting to amputation. The result of such a procedure must, from a client's point of view, be a paying one. Those whom I have consulted are satisfied that it is.

There are, however, certain points to bear in mind. If the animal is but a calf a few weeks old, every effort should be made to get it in condition to kill for veal as soon after the operation as possible, and not allow it to reach that age when the flesh is neither veal nor beef. In older animals, after the first week or two generous feeding is essential to get the animal fit for the butcher in the minimum of time.

The necessity for the observation of these points arises from the fact that when an animal has only three legs, one of two things occurs: either the flexors of the remaining limb supporting the one half of the body weight gradually give way, allowing the fetlock to reach the ground, and results in injury to it, or the leg becomes bowed, and interferes seriously with progression.

Prior to amputation of the limb in cases of compound fracture, particularly those of some hours' standing, and soiled with dirt and litter, a careful examination should be made to ascertain the extent of infection. The area is frequently emphysematous, due more to aspiration of air than to gas-producing organisms; still, it must be looked upon as suspect. The seat of operation should be two or three inches higher than the area involved. If the infected area encroaches upon a joint, the amputation should be made above the joint. Removal of hair, and disinfection of the field with iodine, or preferably a mixture of crystal violet and brilliant green, are necessary.

The operation itself is simple and requires little special knowledge. Under chloroform anæsthesia a tourniquet is applied to the limb, and an incision is made through the skin so that two flaps are formed. The muscles are then severed to the bone. The two or three main blood vessels are ligatured with aseptic catgut, and the nerves are cut through and shortened as much as possible, to prevent the formation of painful bulbous nerves. A linen retractor is then applied. The retractor is formed by tearing a square of linen from one side to the centre. The tails are passed on either side of the bone and crossed.

Traction, on the tails and the untorn piece of linen, is exerted to pull the soft parts out of the way. The bone is then sawn clearly off as high up as possible. There must be no jagged pieces or splinters of bone left on the edges. The tourniquet is eased and hæmorrhage controlled. The stump is washed with iodine or mopped out with spts. vin. meth., and well smeared with B.I.P.P. The flaps must now be trimmed to the right length for suturing. If too long, they must be shortened to the extent that they meet comfortably over the stump. The flaps are united with interrupted sutures and well painted with iodine. The leg of a stocking tied at one end, and partially stuffed with cotton wool, is then drawn over the stump.

After-treatment consists in daily application of tincture of iodine to the stump, and removal of stitches in ten days' time.

Five cases have been dealt with in the last year.

Case 1.—A heifer injured on the road, probably by a motor car. It sustained a compound fracture of the metacarpal, and was operated upon above the knee eighteen hours after the accident. The carpal joint was emphysematous.

Case 2.—A calf, which, whilst galloping over rocky ground, fell and fractured its radius. The end of the bone protruded through the skin. The operation was performed twenty-four hours after the injury occurred. This calf is in excellent condition. It should have been slaughtered some time ago before it got beyond the veal stage. Its fetlock is now in a condition of extreme flexion.

Case 3.—A calf, the history of which is shrouded in mystery. It was found with a compound fracture of the metatarsals, and was operated upon eighteen hours later.

Case 4.—A yearling bull, with compound fracture of the radius, sustained through awkwardly leaping a fence.

Case 5.—A yearling heifer, with the lower third of the tibia protruding through the skin.

I am satisfied that amputation is such cases as these is essentially a practical procedure.

Cattle are remarkably good patients; they take chloroform well, the stage of excitement is very short, and comparatively little chloroform produces a long anæsthesia. Their legs are not surrounded by great masses of muscular tissue. The one visit for the operation is the only one needed. The owner is not troubled with long and tedious dressings—a simple smearing of iodine daily, at most, suffices. The patients do not fall off in condition, and after a week or two start to fatten. They must, of course, be permanently confined, and not allowed out, or serious deformity will soon occur.

R.A.V.C. Old Comrades' Association.

Second Annual Dinner.

The second Annual Re-union Dinner of the R.A.V.C. Old Comrades' Association was held at Anderton's Hotel, Fleet Street, E.C., on Friday, the 8th December, 1922.

Nearly 200 members of the Association and past and present members of the Corps sat down to the excellent dinner provided.

Major-General Sir L. J. Blenkinsop, K.C.B., D.S.O., was in the chair, and among those present were the following: Major-General W. Dunlop Smith, C.B., C.M.G., D.S.O.; Colonels W. B. Walters, C.B., F.R.C.V.S., G. M. Williams, C.M.G., A. G. Todd, C.B.E., D.S.O., and W. A. Wood; Lieut.-Colonels R. C. Cochrane, C.B.E., F.R.C.V.S., A. J. Williams, D.S.O., F.R.C.V.S., H. S. Mosley, D.S.O., W. A. Jelbart, E. P. Argyle, D.S.O., K. McL. McKenzie, D.S.O., A. E. Clarke, J. MacArthur, O.B.E., T. D. Young, O.B.E.; Majors E. C. Webb, O.B.E., F.R.C.V.S., H. E. Gibbs, D.S.O., J. Ashmead-Boseley, E. M. Perry, O.B.E., F.R.C.V.S., T.D., P. W. Dayer-Smith, O.B.E., T.D., and F. G. T. Hobday, C.M.G., F.R.C.V.S.

An excellent programme of music was provided by Mr. Lois Osborn's Orchestra (Mr. Osborn, by the way, being an ex-member of the Corps); and Mr. Charles Pond immensely amused everyone by his wonderfully humorous character studies.

Major-General Sir L. J. Blenkinsop, in proposing the toast of the Association, said that it had been decided that afternoon to reduce the annual subscription from 5s. to 1s., and that consequently there was no excuse for any man not joining the Association on the score of expense. He wanted to impress upon every man who had served in the Corps that, although he might not require assistance from the Association, there were those who did—and it was to get at these that they wanted a large membership. We wanted to get old comrades together. They had progressed very far along the road to success; they now had 360 members, and he considered that this was good in view of the fact that they had been in existence only a matter of two years. It was, however, not good enough considering the large number who had served in the Corps. He would ask all present to endeavour to enlist at least one new member, if no more, before they met again next year. We did not want money. What they wanted was members. He knew that there were enormous numbers of men out of work. The men they had during the war were good fellows, who, he was quite sure, if they were unemployed would be the kind who would want to work. They wanted fellows to get together in Associations like that to help each other and to maintain the good name of the Corps. (Applause.)

(Applications for membership, with an enclosure of 1s., will receive immediate attention, if sent to the Secretary, R.A.V.C., Old Comrades' Association, c/o R.A.V.C. Records Office, Woolwich, S.E.)

Association Report.

South-Eastern Veterinary Association.

A general meeting of this Association was held at the Royal Fountain Hotel, Canterbury, on Wednesday, September 27th.

The President, Mr. T. F. Hogben, occupied the Chair, and there were also present:—Col. F. S. H. Baldrey, C.M.G., Major G. W. Dunkin (Canterbury), E. Morgan (Faversham), O. V. Gunning (Nonington), E. Lyne Dixson (Margate), Major L. Lyne Dixson (Ramsgate), C. Roberts (Tunbridge Wells), W. W. Gulleford (Hythe), and Hugh P. Hogben, *Hon. Sec.*

An abstract having been read, the minutes were confirmed.

The President then called upon Mr. O. V. Gunning to read his paper on "Metritis from a Practitioner's Standpoint."

[Mr. Gunning's paper appears elsewhere in the present issue, together with the discussion which followed.—Ed.]

The Chairman said their thanks were due to Mr. Gunning for bringing that particular subject before them, as it was of special interest to the country practitioner, and for the work he had done on the subject.

Attendance at Dog Shows.

Major Dunkin referred to the question of honorary attendance at dog and horse shows, a question which he said had been discussed at previous meetings of their Association. He was one of three who were asked to attend and examine dogs at the recent show at Maidstone, which was 27 miles from Canterbury, which, with return, made a journey of 54 miles. They worked hard all the morning, dogs coming in all the time. Many dogs were turned back for distemper, for which decisions the examiners were not too popular. (Laughter.) At a quarter to one he approached the Secretary and asked whether there was any objection to his going, and the Secretary said, "I don't think you need stay any longer. Good day." He was not offered a luncheon ticket, and none of them had received a letter of thanks. That was the last show he should attend at Maidstone, and he was going to ask the other two gentlemen not to attend again. He thought it was high time that honorary attendance at dog shows should cease.

With regard to agricultural shows, although the principle was the same, the conditions were rather different, and it raised a big point; but with regard to dog shows it was entirely different. Dog shows were very popular, and every Canine Society in existence was making vast sums of money, and ninety per cent. of the exhibitors were also making money. For that reason he considered honorary attendance ought not to be continued.

The Chairman said he agreed with Major Dunkin. With regard to agricultural shows it was rather different, because they were of more interest to almost

every branch of agriculture. They were associated with a great many men who were exhibiting, and they were willing to help.

The HON. SECRETARY suggested that Major Dunkin and the other two gentlemen should send a letter of protest to the Show Committee.

Major DUNKIN: That is what I am going to do the next time I am asked.

N.V.M.A. MEETING AT BATH.

Mr. ROBERTS gave an interesting report on the meeting he attended at Bath, and said. "If more members of the profession would take an interest in the N. V. M. Association it could be made a much greater success. There were people who put in many hours of hard work in connection with it, and it was due to them that there should be a good attendance at the Annual Gathering. The meetings gave one an opportunity of enlarging one's views and improving one's scientific education. He appealed to all who were not members, to subscribe to the N.V.M.A. and to take an interest in it, and help to make it 'go.' The N.V.M.A. corresponded to the British Medical Association in the medical world, and its annual meeting was a very nice function to attend, apart from its scientific value and its educational side, because its social functions—a programme of which might, with advantage, be published in the *Record*—presented many attractions, and gave great pleasure. This opinion, he felt sure, would be endorsed by all those who attended the Bath meeting.

Major DUNKIN said he also attended the meeting, and the papers and demonstrations were of the highest interest and value. He had to render his thanks to Mr. Morgan for attending to his practice in his absence. He could not have gone but for the assistance of his colleagues.

HON. SECRETARY: Myself also.

It was arranged that the Annual Meeting and Dinner of the Association should take place at Tunbridge Wells in January.

HUGH P. HOGBEN. *Hon. Sec.*

College Jottings.

Narrator of the "facts" relative to a case of strychnine poisoning: "I gave the suitable *anecdotes*." (Conclusion!)

Answers to Correspondents.

Would-be fancier, Wanstead Flats:—You are quite correct, a Sealyham *has* got shorter legs than a Fox terrier. But in any case they should be long enough to reach the ground.

Enquirer, Kentish Town:—You have been misinformed. That beautiful mound planted with croci and surrounded with wire-netting in the front quadrangle is *not* the grave of the student who was caught smoking in the library.

Abstracts and Reviews.

Revista de la Facultad de Veterinaria.

We have received the first number of this new publication, which is issued under the editorship of Dr. Fernando Malenchini, with the assistance of other professors in the Faculty of Veterinary Science of the University of La Plata. Dr. Malenchini is Professor of Anatomical and Pathological Histology, Embryology, and normal Histology in the Faculty of Veterinary Science, and he contributes a report on the present state of our knowledge of the Etiology of Tuberculosis, being the third of a course of Anti-tuberculosis Lectures delivered in La Plata in October, 1921. Other articles include a "Contribution to the Study of Filariosis elephantiaca of the Horse," by Dr. V. Bossi, Director of the Clinical Hospital at the Veterinary Faculty, and Dr. D. Espinal, assistant in Parasitology. This is an exhaustive paper, accompanied with excellent illustrations. There is a further article on the Toxicity of the Urine of the Horse, by Dr. Otaño, Head of the practical Clinique, and another on Rinderpest, by A. N. Candioti and A. C. Marchisotti. The new journal is to appear quarterly, and we give it a cordial welcome as a useful addition to veterinary literature.

Atoxyl in Sclerostoma Infestation.

Definite diagnosis of parasitic disease was made by examination of the fæces after two drenches, each composed of 2 oz. of turpentine, ½ pint of linseed oil and 1 pint of milk.

For three days a daily drench of thymol 1 oz., oil of chenopodium 1 oz., liquid paraffin 4 oz., milk and water 3 pints, was given.

Daily injections of 10 gr. of atoxyl and powders composed of 30 gr. of arsenic were also administered.

The drenches appeared to put the pony off her appetite, the quantity of thymol was therefore reduced to ½ oz., and only two were given per week. An increase to 60 gr. of atoxyl caused purgation, but the dose of arsenic was increased to that amount.

After three weeks the drenches were discontinued (it is not clear what interval elapsed between successive sets of three daily doses of the mixture containing thymol and oil of chenopodium), but the atoxyl and arsenic were continued for a month.

[REES-MOGG (G.) The Treatment of Sclerostoma with Atoxyl.—*Vet. Jl.* 1922, Mar. Vol. 76. No.3, pp. 103 104.]

Chenopodium Anthelminticum.

The common name in France is Ansérine vermifuge.

Originally a plant of tropical America, *Chenopodium anthelminticum* is now found practically everywhere. It is especially cultivated in Maryland in the United States.

The particular variety used for the preparation of the essential oil is *Chenopodium ambrosioides* var. *anthelminticum*.

The seeds of the plant contain 0·6 to 1, and the leaves 0·35, per cent. of the essence. On an average the oil contains 65 per cent. of ascaridol, 22 per cent. of cymol, and some dioxyterpene.

It is soluble in alcohol, but is not miscible with other liquids.

The drug is particularly active against round worms. It should be given after a period of fasting of at least 24 hours, and should be followed by a dose of linseed or castor oil.

In its action chenopodium does not differ from other vermifuges. It does not kill the parasites, but narcotises them, hence the necessity for the administration of the purgative immediately after.

Should one treatment fail, which may happen if the purging is not sufficiently thorough, an interval of eight days must be left before the chenopodium is repeated.

The administration of the purgative immediately after the chenopodium not only ensures the expulsion of the paralysed worms, but prevents gastric absorption, hastens the passage of the drug through the intestine, and thus prevents absorption of it.

Cats appear to be more susceptible to its poisonous action than dogs.

In all animals and man large doses produce deafness, which, if the dose be sufficiently large, may be permanent. When excessive doses are given death results from paralysis of the respiratory centre.

For horses the dose varies from 15 to 20 cc.

In all cases it is preferable to divide the dose into three or more parts, which are given at intervals of an hour or more. In this way the parasites are subjected to the action of the drug for a more prolonged period.

In the dog the dose is 0·1 cc. per kilo.

It is best given in gelatin capsules on account of its objectionable taste and smell, and of the burning sensation it produces. In the absence of capsules it may be given shaken up in castor oil, but it soon rises to the top and makes the administration more difficult.

The alcoholic extract is miscible with glycerine and can be made into a syrup. Powdered seeds are more convenient for horses.

The dose is from 20 to 30 gm. in the form of an electuary repeated on two or three consecutive days and followed by a purging ball.

[Bru (P.). Le Chenopode anthelminthique. (Chenopodium anthelminthicum.)—*Rev. Vet.* 1922. Apr. Vol. 74. No. 4. pp. 217-225.—*Ex. Trop. Vet. Bulletin.*]

The Warble Flies.

The observations regarding the life-history of the fly which were published in 1914 have been confirmed; it having been definitely established that the newly-hatched maggots gain access to the host's body by penetration of the skin and not *via* the mouth.

It was again found that muzzling actually increased the average number of warbles found in the experimental calves. By licking itself an animal dislodges a number of the eggs.

Feeding calves with large numbers of maggots (100) failed to infect.

In experiments in which maggots hatched out artificially were placed on the skin, and eggs themselves were placed on the skin and kept in place by bandages, negative results were obtained.

On the other hand, calves which were protected by clothing, leaving only the hind legs exposed to the attacks of flies, showed maggots the following spring. The experiment further proved the migration of the maggots from the hocks, or below, to the backs. It was not found possible to trace the migrations of the young maggots from the skin to the œsophagus, where they are found in their "second stage" from October till February.

The larva appears to pass through five phases of development. The pupal stage ranged from 46 to 32 days, decreasing as the season advanced.

During 1915, washes composed of pure nicotine and linseed oil in proportions ranging from 1 to 0·25 per cent. were tried. The 1 per cent. was found to be very effective, but it produced alarming symptoms in some of the animals and its use was discontinued. In 1919, experiments with washes containing tobacco powder and lime gave promising results.

In 1921, departmental experiments were carried out with a wash containing 4 lb. of tobacco powder, 2 lb. of lime to 1 gal. of water. In the majority of cases one dressing was given, with the result that 78 per cent. of the maggots were killed. In those cases (37 in number) in which two dressings were given, 89 per cent. of the maggots perished.

A more successful treatment still was the use of sulphur dioxide gas applied under pressure (with impermeable covers over the animals' backs) for a minute. By this means, which had previously been employed and had resulted in the destruction of 93 per cent. of maggots, 96 per cent. were killed. The method, however, is not applicable on a large scale.

As yet no dressing has been found which is effective for the prevention of oviposition, but experiments are being continued.

[Carpenter (G. H.), Phibbs (G.), and Slattery (T., the late). The Warble Flies.—*Jl. Dept. Agric. and Tech. Instruc., Ireland.* 1922. May. Vol. 22. No. 1. pp. 14-25.—*Ex. Trop. Vet. Bulletin.*]

B. Abortus agglutinin Experimentation.

"The experiments to be reported differ from those of others in that they deal with the naturally acquired and stored agglutinins as the result of a definite infectious disease of cows, localised in the fœtal membranes. Earlier experiments deal only with agglutinins experimentally induced."

The bulk of the paper is composed of tabular statements of the various experiments carried out, and these do not lend themselves readily to abstraction.

The authors state that, with rare exceptions, the blood of a new-born calf is free from agglutinins until it has

sucked, although the blood and the colostrum of the dam may have a relatively high content of agglutinins.

When colostrum was withheld, and milk of a low or negative titre substituted, agglutinins failed to appear or accumulate in the blood of the calf.

The concentration of agglutinins in the colostrum may exceed that of the blood at or immediately after parturition.

Agglutinins begin to appear slightly over an hour after the calf has ingested colostrum, and in nearly all cases were at a maximum five hours after feeding.

The problem of the production of agglutinins by the fœtus in whose tissues *B. abortus* has multiplied, and which is subsequently expelled prematurely, is not touched by these observations.

[Little (Ralph B) and Orcutt (Marion L). The Transmission of Agglutinins of *Bacillus abortus* from Cow to Calf in the Colostrum.—*Jl. Experim. Med.* 1922. Feb. 1. Vol. 35. No. 2. pp. 161-171.—*Ex. Trop. Vet. Bulletin.*]

Thiosulphate Test for Kidney Functioning.

The author injects intravenously 10 c.c. of a 10 per cent. solution of sodium thiosulphate, and examintes the urine voided once each hour for three hours. About 20 c.c. from each portion of urine is mixed with 0·5 gm. of animal charcoal, stirred well for two or three minutes, and then filtered. Each filtrate is then mixed with 10 c.c. of starch solution, and then 1/10 normal solution of iodine is added and the blue tint is titrated. The urine voided just before the test is treated similarly. From 60 to 70 per cent. of the sodium thiosulphate is oxidised in the body to sodium sulphate, and the remaining 30 to 40 per cent. is eliminated unmodified in the urine, if the kidneys are sound. If the kidneys are diseased, they do not eliminate the drug, only from 1 to 23 per cent. being found in the urine. The elimination occurs almost entirely during the first hour. As 1 c.c. of the 1/10 N. iodine corresponds to 15·8 mgms. of sodium thiosulphate, the number of c.c. of the iodine solution used is multiplied by 15·8 to obtain the number of mgms. of thiosulphate in 10 c.c. of urine (after deducting the 1 c.c. or other figure representing the amount required by the urine voided before the test).

[W. Nziri (*Wiener Klin. Wochens.*, Vienna, June 29th, 1922. 35, No. 26, 582; *Journ. Amer. Med. Assoc.*, September 30th, 1922, 1185). *Ex. Pharmaceutical Journal.*]

Burns and their Treatment.

Animals die from burns by reason of the poisons generated in the burned tissues, unless they can manufacture antibodies or have them supplied from without promptly enough to annul the toxic action. Serum from a guinea-pig that had been burned, and had produced antibodies, when injected into another guinea-pig, protected it against fatal harm from a burn experimentally induced afterwards, even when more than half of the body was gradually subjected to a burn of the third degree. Experiments show that serotherapy is capable of warding off the toxic action from a burn—the toxæmic shock, which is the main factor in the fatal outcome of burns. The author urges the systematic production and use of an anti-burn serum. It can be obtained from patients convalescing from burns.

[A. Kotzareff (*Rev. de Chirurg.*, Paris, 1922, 60, No. 1, 5; through *Journ. Amer. Med. Assoc.*, August 5th, 1922, 507]

Bombay Reports.

(*Continued from page* 969.)

Preventive Measures.

The number of cattle inoculated against rinderpest amounted to 32,900. These inoculations were carried out in only 307 outbreaks of the 699 attended by the staff.

In the outbreaks in which inoculation was performed 4,303 uninoculated animals and 191 inoculated animals died.

One hundred and eighty-seven animals in the Charodi Government Farm, Ahmedabad, were protected from rinderpest by the serum simultaneous method.

Of the 291 outbreaks of hæmorrhagic septicæmia attended by the staff inoculation was carried out in 65 outbreaks on 4,922 animals.

Vaccination against this disease was carried out in four villages on 739 animals.

During the course of the outbreaks in which inoculation was performed 615 uninoculated and 4 inoculated animals died. There were no deaths amongst vaccinated animals.

In 16 outbreaks 754 animals were protected against anthrax. Eighty-five from the uninoculated and 5 from the inoculated animals died.

Forty-seven animals were successfully protected by vaccination against black-quarter at the Tegur Government Agricultural Farm, Dharwar district.

This year Rs. 554-7-0 were recovered as fees for inoculation against hæmorrhagic septicæmia and anthrax and vaccination against hæmorrhagic septicæmia, as against Rs. 769-3-8 least year.

The work of inoculation has not been so extensive as last year, the number of inoculations being only just over half the number carried out in 1920-21. This may be attributed to the fact of the agriculturists being ill-advised by certain malicious persons.

General Remarks.—The work in the hospitals has been well maintained.

The outstanding features of the year are the widespread outbreak of foot-and-mouth disease and the increase in the number of deaths from all other contagious diseases among cattle. Foot-and-mouth disease has never been so wide-spread in this Presidency, and it was with the greatest difficulty that the staff was able to deal with it, especially in the Dharwar Division and they deserve great credit. The number of deaths reported from rinderpest is nearly double that of last year, and hæmorrhagic septicæmia claimed nearly five times the number of victims. It is very regrettable that inoculation work has had such a set-back during the year, and it is probable that this is the cause of the large number of deaths from contagious diseases.

The energies of the Department will be directed towards the practical application of modern scientific methods of treatment of disease, both curative and prophylactic.

Investigations will be undertaken regarding the extent to which tuberculosis and Johne's disease prevails in the Presidency.

Notes and News.

The Editor will be glad to receive items of professional interest in these columns

Cancer Treatment.

THE USE OF COLLOIDAL LEAD.

Recently a report was made to the Court of Liverpool University about a method of treating cancer cases which is at present being experimented with. Details of this method show that it consists in the injection direct into the blood-stream through the veins of a preparation of lead in colloid form.

The colloidal forms of the metals, says the medical correspondent of *The Times*, are now in frequent use in medicine. They consist of suspensions of minute particles of the metal in a fluid medium, and can best be described by using the analogy of the particles seen to be moving in a beam of light in any living room.

It has been found that lead effects a chemical combination with a substance found in great profusion in the cancer cell—namely, *lecithin*. The combination apparently stops the growth of the cell, and so, of course, of the tumour, which has arisen from multiplication of these cells. Tumours removed surgically after lead treatment are found to contain a large quantity of the metal. Some tumours, it is stated, have disappeared in consequence of the treatment.

The interest of the work is that any cancer cell in the body is likely to be affected by the treatment. On the other hand, no assurance of any kind can be given at present that success in the popular sense has been or will be attained. The work is in its experimental stage; and the many disappointments of the past make the utmost caution in discussing it absolutely imperative. The occasion, indeed, seems to call for a repetition of a truth too little understood by the public—that the only course at present, when this disease has been detected, is to place its treatment in the hands of a surgeon.

Sir Stewart Stockman on Warble Fly.

Addressing the members of the Renfrewshire Agricultural Society, Sir Stewart Stockman, whose remarks were illustrated with limelight views, dealt with the life-history of the Bot or Warble Fly, and the damage it causes. The lecturer stated that the loss occasioned by the pest in the deterioration of hides was estimated at about £1,000,000 per annum. In this estimate, however, no account was taken of the losses due to the damage to the flesh of affected cattle from the suppurative process, nor of the losses in dairy cattle and beasts due to "gadding." Sir Stewart described the life-cycle of the pest, and remarked that it should be obvious that any plan of attack should be based on breaking some important part of the cycle, which would inevitably lead to the destruction of the species. Among the suggested remedies was dressings which would destroy the maggots when simply sponged on to the tumours, after the punctures in the skin of the animal were well established. The Committee which had been investigating the matter thought it advisable to concentrate on this, as it promised the greatest degree of practicability. Many substances were tried, and although several succeeded up to a point of 50 per cent., only one gave results approaching 100 per cent. This was a solution of lime and tobacco. The dressing, after extensive trials, had been found to kill 80 per cent. Field trials were proceeding, and it was hoped farmers in general would give a helping hand in extending these trials. Co-operatve campaigns extending over three seasons would in all probability result in the eradication of warbles from a district.

THE MODERN BRITISH THOROUGHBRED.

Lord Woolavington, replying as the winner of the Gimcrack Stakes to a toast at the dinner of the Gimcrack Club, at which Prince Henry was present, said, in comparing the modern British thoroughbred with that famous grey horse, "I am not going to suggest to you that because Gimcrack was a good horse 155 years ago—and he *was* a good horse, for he won twenty-five races and was only ten times beaten—he bears any comparison with the British thoroughbred of to-day. It is on record that he stood only just over 14 hands, and I am sure that Town Guard stands fully two hands higher than that. Such has been the progress in size, and, I believe, in the quality of our horses. May I be permitted to suggest to you that Town Guard is superior to all of us, in that he represents Unionist and Imperialist interests, without any dissension, being as he is British-born, bred by myself, a Scotsman, from a mare whose grandam was by Carbine (bred in New Zealand, and famous for all time for his winning record in Australia); trained by Mr. Gilpin, an Irishman, and ridden by Archibald, an American. It is surely not unreasonable to say that the British thoroughbred makes the whole world kin, no matter how politicians may conspire to incite differences.

"The Jockey Club is absolutely unique, and though foreign visitors and those from the Oversea Dominions complain of our racecourses and stands, and the general comforts—or discomforts—of them (they cannot do so at York, but I admit they have a right to do so at many places)—they can never alter the fact that British Classic results mark the standard value of the thoroughbred throughout the world, and this solid and persistent fact is due to the traditional maintenance of racing by the Jockey Club in the country where the British thoroughbred was evolved—to the benefit of the whole world."

Obituary.

CAPT. D. H. WOOD, M.R.C.V.S.

We regret to record the death of Captain D. Hamilton Wood, M.R.C.V.S., late R.A.V.C., which occurred on the 14th instant. The funeral took place from his residence at 34 Woodside Road, Wood Green, N., on Monday, December 18th. Captain Wood qualified at Edinburgh in 1890.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

Indian Civil Veterinary Department.

Sir,—As one who spent six strenuous years in the I.C.V.D., may I offer a few remarks on the subject?

If officers of the Department consider that the pay and prospects are bad, why do they stick to their jobs? Why don't they stand on their own legs and "find a better 'ole?" As long ago as 1912, I met brother-officers who did nothing but grouse about their service, but they are still in it, and apparently are still grousing.

I maintain that no thinking European in India can hope for decent conditions for the white man for any length of time under the late policy of "stirring up the placid contentment" of the three hundred million natives of India. I consider it to be quite obvious that the abolition of the Inspector-Generalship in 1912, which was carried out, I believe, without protest and without compensation, could result in nothing but the premanent subordination of the Department, with consequent loss of status and prospects for its members.—Yours faithfully, A. S. LEESE.

20 St. George's Square, Stamford,
December 16th, 1922.

Anthrax in Pigs.

Sir,—The remarks of Mr. R. Bennett, of Romford, on anthrax in pigs, in your issue of the 2nd inst., were very interesting.

But, I think, the reliability of the microscopic examination of the blood as a method of diagnosis depends rather upon the method of infection.

Mr. Bennett's case illustrates admirably the usual method of infection in pigs and the importance of making a microscopic examination of the exudate from the swellings in the neck region.

Sometimes, however, pigs are infected in the ordinary way by infected food materials—I mean other than by the ingestion of offal.

In such cases there is no swelling in the neck region; but again, the high degree of resistance of the pig to anthrax is very marked. It may take as long as three or four days before death supervenes.

On *post-mortem*, the lesions are similar to those in the ox, and—contrary to what is usually accepted—the spleen sometimes is enormously enlarged. The blood, on microscopic examination, is rich in anthrax bacilli.—Yours faithfully, C. V. DAYUS, M.R.C.V.S.

Coton House, Craven Arms, Salop,
December 11th, 1922.

Army Veterinary Service.

LONDON GAZETTE. WAR OFFICE. REGULAR FORCES.

December 15th.—Maj. and Bt. Lt.-Col. J. J. B. Tapley, D.S.O., is restored to the establishment (Dec. 16th).

TERRITORIAL ARMY.

Capt. T. Dalling is appointed to command a Veterinary Hospital (Dec. 16th).

ARMY PROMOTION.

The names of the following senior officers appear in the list, published on December 15th, of those who have passed the prescribed examination for promotion:—Majors B. L. Lake, D.S.O., O.B.E., E. C. Webb, O.B.E., E. Gibbs, D.S.O., and H. J. Holness, D.S.O.

Diseases of Animals Acts, 1894 to 1914. Summary of Returns.

Period.	Rabies.		Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy).*		Parasitic Mange.*		Sheep Scab.	Swine Fever.	
	Cases Confirmed.												
	Dogs.	Other Animals.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaught'd as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks reported by the Local Authorities.	Outbreaks confirmed.	Swine slaughtered as diseased or exposed to infection
GT. BRITAIN.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended 16th Dec., 1922 ...	..	...	14	15	1	105	...	...	26	38	33	43	28
Corresponding Week in 1921	...	...	13	16	...	...	...	...	17	25	45	28	7
Corresponding Week in 1920	3	...	19	27	..	...	...	...	34	51	26	20	3
Corresponding Week in 1919	2	...	6	7	1	78	1	1	111	185	30	35	14
Total for 50 weeks, 1922 ...	1	...	490	562	1138	55499	4	4	977	1366	597	1322	505
Corresponding period in 1921	22	1	479	608	44	3085	11	45	1959	2960	580	1205	442
Corresponding period in 1920	37	...	436	521	80	11276	15	25	3455	5628	443	1763	698
Corresponding period in 1919	150	5	223	294	71	3144	23	59	4759	9357	380	2235	1015

NOTE.—The figures for the current year are approximate only. *Excluding outbreaks in Army horses.

IRELAND.											
Week ended 16th Dec., 1922...	...	...	...	...	...	...	Outbreaks ...	2	3	21	
Corresponding Week in 1921 ...	...	...	...	...	...	...	1	1	1	3	
Corresponding Week in 1920 ...	...	...	...	...	..	...	...	12	1	3	
Corresponding Week in 1919 ...	...	...	...	...	...	...	1	11	1	6	
Total for 50 weeks, 1922	1	1	...	...	...	...	75	209	228	1315	
Corresponding period in 1921 .	1	1	7	77	...	..	75	259	113	610	
Corresponding period in 1920 ...	1	1	...	...	1	3	92	329	15	44	
Corresponding period in 1919 ...	...	...	...	...	1	1	137	277	33	102	

NOTE.—The figures for the current year are approximate only.

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Grass Disease
Borna Disease
Forage Poisoning
Blind Staggers
Cerebro-Spinal Meningitis

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